THE NATIONAL UNIVERSITY.

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A GROWTH; NOT A CREATION.

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IN EXCHANGE

THE NATIONAL UNIVERSITY.

Material for it now in Washington, and the Relation of the Civil Service to it.

We Americans do not, as a rule, believe in "the day of small things." Whatever we do, we like to do on a great scale and with a great rush and a great noise. Sometimes we are unwilling to do anything at all until we can do something very grand. Unquestionably, it is wise not to try to do a thing until we are prepared to do it well; but our weakness is that, being a young and inexperienced people, whose growth has been rapid beyond precedent, we are not willing to wait for things to grow. We believe in making things outright by our might, or buying them forthwith with our money. We do indeed possess magnificent powers of initiative, but we trust too much to those powers to accomplish our purposes, and oftentimes try to do things before the conditions are present and the times are ripe for them.

We also believe in the power of the legislative fiat, and think we can accomplish anything by passing an act through Congress or a legislature. Born legislators, every one of us, we think we can educate the people by law and make them good by law. "Be it enacted" is our method of making all improvements and our remedy for all social ills.

A multi-millionaire who was considering the plans for a great university which he proposed to establish is said to have asked the distinguished president of an institution which he had just inspected by way of informing himself with regard to such matters, "Well, you have a big plant here; how much does it stand you in?" In like fashion the ordinary American business man thinks, no doubt, that when we decide that we want it we will appropriate a vast sum of money, erect a magnificent pile of buildings, and establish a board of regents made up of distinguished men who, in turn, will organize a series of great faculties, and that these faculties will go to lecturing at once in beautiful halls to expectant crowds of young people —and there is the National University!

Every student knows that even with all this grand outfit we would still not have a true National University until we also have great scholars, thinkers, and investigators to teach, and great laboratories and libraries in which they and their students can work. Congress can not create thinkers or build laboratories or collect libraries, even in a decade. Even with all these things present, there would still be lacking the university spirit and atmosphere, which are the results of development and the products of national culture.

We have not had a National University before, because we were not prepared for it. We were not competent to maintain or appreciate it. A National University is the richest fruit of the civilization of the people, and we will see our great University opened when we are noble and cultured enough to be worthy of it. Washington foresaw clearly the necessity for such a university and provided for it as far as he could; but even he could not foresee that it would require a hundred years for the nation to take its primary, high school and collegiate training, and so be prepared for the graduate course. If the times are now ripe for a National University, as many of us believe they are, it is because we have, as a people, completed our preparatory course, and are now ready to improve the opportunities afforded by such an institution. If the time has arrived to begin the work of its organization, it is partly because the scholars and thinkers are here, because many of the laboratories are already built, and our various national libraries are full of books; but, if we are ripe for the National University, it is chiefly because the spirit of study and research is beginning to stir our whole people. The real National University already exists in spirit, in the great scientific and historical establishments in Washington and throughout the country, and the time has come to give it a body.

In an article in SCIENCE for January 15, the writer enumerated the scientific establishments of the Government designed to develop the natural resources of the country, for the purpose of pointing out the necessity for their better organization as a step toward the proper coordination of their work. It is proposed at this place—

First, to look at these and the other scientific bureaus of the Government from the point of view of a National University, so as to see what we already have in Washington as basal material for such an institution and what will have to be provided; and

Second, to point out a method by which the Civil Service Commission can be used to promote the National University and assist proper persons in securing its advantages and opportunities.

I.—Material Already in Washington.

A good deal of work is going on in the Congressional Library and the libraries of the State and other Departments, which corresponds to the literary work of a university, but there is little else in the Government in Washington which would answer as a foundation for the departments of philology and philosophy of such an institution. These, however, are almost the only important departments which are not already represented here. Anthropology is represented by the Bureau of Ethnology and several other bureaus in the Smithsonian Institution and the National Museum. Political science and the science of society are represented by the several Executive Departments, by Congress, and more especially in the work of the Congressional and other great libraries. Economics is pursued in many of its branches by all of these and especially by the Bureau of Statistics of the Treasury Department, the Department of Labor, and the Census, which we hope is soon to be made a permanent bureau. Jurisprudence and law are represented by the Supreme Court and the other courts of the District ; history by several bureaus in the State Department, the Smithsonian Institution, and the Congressional Library; and education by the Bureau of Education, the office of Indian Affairs, the Department of Agriculture, etc. In these we have already, if not active teaching agencies, at least the very best facilities for investigation in these subjects to be found anywhere in this country, if not in the world.

It is in the department of science, however, that the Government has the most and best basal material ready to hand upon which to build a National University. This department is weakest, perhaps, in some of the pure sciences. Mathematics, however, is ably represented by the National Observatory and the Nautical Almanac. Physics is illustrated extensively in the several bureaus of steam engineering, construction and ordnance of the Navy Department, and in the engineering and testing laboratories of the War Department. Almost every conceivable application of physics is studied in the Patent Office and many of them also in the Coast Survey and

the Weather Bureau. Engineering is represented in the Coast and Geodetic Survey, the General Land Office, the various hydrographic offices, and many other bureaus. Chemistry is practiced extensively in many laboratories, notably those of the Geological Survey and the Department of Agriculture.

In the Geological Survey and the National Museum we have the material for a department of geology, geography, palæontology, etc.; in the National Herbarium and the Division of Botany of the Department of Agriculture the material for a school of botany; in the Biological Survey, the Commission of Fish and Fisheries, and the National Museum again, a complete collection of specimens and equipment is found for a department of general biology. And so through all the natural sciences. The men, the material, and the laboratories are nearly all here already.

The material for the great professional departments is even more abundantly supplied. Medicine is magnificently represented in the office of the Surgeon-General of the Army, to which belongs the great Army Medical Museum and Library, and several laboratories. A graduate school for army surgeons has already been established under this office. In the same connection are to be mentioned the Marine Hospital Service of the Treasury Department, with its admirable laboratories, the Bureau of Medicine and Surgery of the Navy, and the bacteriological and pathological laboratories of the Bureau of Animal Industry.

The material for the professional department of jurisprudence and law is, of course, unsurpassed. Law libraries are found in the Supreme Court, and in nearly all of the other courts, and in several of the Executive Departments. In fact, it would seem that everything is ready at hand for this department, save only the central organization and the lecture halls.

In the Department of Agriculture we find all the material ready to hand for a college of agriculture, horticulture, and forestry; in the Bureau of Education are stores of statistics and other data for the use of students of pedagogics; in the office of the Architect of the Treasury there is the foundation for a school of architecture and construction. In fact, so much material is found in Washington that it will be difficult to decide which schools should be started first and which postponed to some future time.

II.—The Civil Service Commission and the National University.

The relation of the Civil Service Commission to the National University has not received sufficient consideration. The danger from the spoils system has been the chief objection to the National University in the minds of some of our greatest and best men. Every one appreciates, therefore, the service which the Civil Service Commission has rendered the cause by removing all opportunities for this vicious practice. The time has now arrived, however, when the Civil Service Commission can render this enterprise additional service by establishing a method through which properly prepared students can gain a support, corresponding to scholarships and fellowships, while prosecuting their studies in the different departments of the National University. It is to the method proposed for this purpose that the writer particularly desires to call the attention of scientific men at this time.

It is now proposed by the Civil Service Commission to establish a regular system of examinations to be held at stated periods, convenient to the great educational centers in the country, once or twice each year, for the purpose of examining applicants for positions in the scientific service of the Government. The general plan may be sufficiently indicated by describing the one already drawn up for the Department of Agriculture, which was the first to take it up.

All scientific assistants in this and the other bureaus of the Government, here referred to, have recently been brought into the classified service, as the clerical places had been before. To fill these positions it was necessary to arrange a systematic plan of examinations. Heretofore such of these places as were included in the classified service were filled by special examinations held at irregular intervals at the request of the Secretary of the Department. An examination was usually given for each particular position and an eligible list provided, from which only one person was taken.

The objections to these special examinations are numerous. The notices given by the Civil Service Commission were necessarily short, and did not become widely known. The examination questions were hastily prepared to secure an eligible to fit a particular place with the result that the person certified for the position had too often only narrow special, rather than broad scientific training.

Too frequently the Department has secured by this process only amateur scientists, having perhaps some ability and considerable knowledge in certain lines, but without general education and therefore limited in their usefulness and capacity to grow.

Another objection was that the list of eligibles provided in this manner was a temporary one only, being designed to get one person to fill one place. Under the rules of the Civil Service Commission such a list lived for one year only, and it was, therefore, rather unusual when a second person was taken from it. Such a system of examinations offers too little encouragement to candidates. Since special papers had to be prepared for each one of them and the examinations to be held in different parts of the country wherever there were applicants, these special examinations were also troublesome and expensive to both the Civil Service Commission and the Department.

For their best work the scientific bureaus of the Government need men of broader training than can be secured in this way. The ideal man, of course, for such a position is one who has had a liberal education, to which has been added general education in the natural sciences and special training and experience in some special department. In order to secure such a corps of experts it was necessary to establish the permanent lists of eligibles, and keep them up by regular examinations, held at stated intervals.

After the new men are appointed in the Department it is desirable to give them, before they are advanced to positions of responsibility, some preliminary training in the special work of the particular bureau. In the new plan it is provided, therefore, that these candidates shall come into the lower ranks first, where they shall have opportunities for advancement, if they prove worthy. The outlines of the plan proposed for the Department of Agriculture are given in an appendix to this paper.

It will be noticed that the examinations are not for specified positions but for certificates of qualification in specified subjects or groups of subjects. Each candidate can form his own group of subjects to suit himself. The Civil Service Commission publishes lists of the various positions in the Government scientific service and the general qualifications required for each. When he requests the certification of eligibles the Secretary names the qualifications he

desires, and the Commission certifies the three persons who have the highest grade in the subjects mentioned or come nearest to supplying all of the qualifications required.

It is hoped that the plan now adopted for the Department of Agriculture will, if it prove successful, be extended to include the other scientific bureaus of the Government. All that will be necessary in order to do this will be to include other subjects in the examinations. When this has been done it is evident that the scientific service will have a much better list of eligibles from which to draw, and that the scientific students of the country will have, for the first time, a plain way opened up for their admission to these surveys and laboratories and to the enjoyment of the splendid opportunities which they offer.

From the standpoint of the scientific bureaus this plan has the advantage of supplying them with the highest class of assistants. Under it they would get persons educated for the work and capable of improving the advantages offered instead of persons having no special training and little or no ambition to improve themselves and advance human knowledge.

From the standpoint of the National University, the Government pay-roll would be utilized to support a large body of properly educated scholars and fellows in the various scientific faculties. With all our surveys, libraries, and laboratories filled with such educated and devoted persons we would soon have in Washington a noble body of students.

It appears, therefore, that we need to take only two or three steps before we have the National University for which we have waited so long. The first step, of course, will be to properly organize the scientific bureaus of the Government as proposed in my former paper. The next step should be to extend the plan for civil service examinations now arranged for the Department of Agriculture to include all the bureaus of the Government, and thus provide scholarships and fellowships for a much greater number of graduate students. When this is done, the only other thing necessary will be the central organization, with its deans and registrars, the boards of examiners to bestow degrees, and, finally, the outfit of buildings for lecture rooms and examination halls.

APPENDIX.

PROPOSED PLAN FOR CIVIL SERVICE EXAMINATIONS FOR THE DEPARTMENT OF AGRICULTURE.

The object of this plan is to secure for the Department of Agriculture in all the grades of its service candidates having a broad general and scientific or technical training, and to encourage the graduates of scientific and technical schools of collegiate grade to enter the service of the Department in the lower grades with a view to making a career in its service or fitting themselves more fully for scientific and technical work in higher positions, either within or outside the Government service. Considerable weight should therefore be given to the training which the candidate has received prior to his examination.

It is proposed to establish a class to be designated "Assistant in the Department of Agriculture" with sub-classes to correspond to the special subjects under A and B below.

I.—Character and Rating of Examinations.

Examinations for assistant in the Department of Agriculture shall consist of five parts, as stated below, and credit shall be given on the following percentage scale:

1.	Basis examination:		
	For the convenience of the Civil Service Commission and as a test of fitness for temporary service on the clerical staff, the regular first grade basis examination is used.		
	Orthography	1.5	
	Arithmetic	2.5	
	Letter writing	2.5	
	Penmanship	1.5	
	Copying	2	
			10
2.	A statement of candidate's general training and experience	5	
	A test of proficiency in English composition	5	
			10
3.	Major examinations on special scientific or technical subject		50
4.	Minor examinations on two required subjects		20
5.	Minor examinations on additional electives		10
	Total		100

II.—List of Subjects on Which Examinations Will be Offered.

Division A:

Chemistry, analytical, agricultural, and industrial.
Physics, especially as applied in meteorology and soil study.
Meteorology.
Physical geography of the United States.
Botany, systematic.
Vegetable physiology and pathology.
Bacteriology.
Forestry.
Ornithology and mammalogy.
Entomology, general and economic.
Physiology and nutrition of man.
Animal pathology.
Animal production and dairying.
Rural engineering.
Statistics, especially of agricultural resources and productions.

Division B:

Bookkeeping.
Stenography.
Typewriting.
Proof-reading and indexing.
Editing and abstracting.
Library work.

Division C:

Latin, French, German, Italian, Spanish, etc. — Translating and abstracting scientific articles in these languages.

Two classes of examinations will be provided in each of the subjects in A and B—a major examination for specialists and a minor examination for those who take the subject as an adjunct to their specialty.

III.—Rules for Examinations.

Candidates must elect one of the subjects in Division A or B as their specialty or major, the examination in which shall count 50.

In addition to the major special subject, candidates *must* be examined on two minor subjects chosen by themselves from Divisions A, B, and C, at least one of which must be from Division A and one from either B or C. Each of these subjects shall have a maximum value of 10.

Each candidate *may* take as many additional examinations from Divisions A, B, or C, as he chooses, but no one examination will count more than 5.

Each candidate shall submit a statement of his educational history and opportunities for scientific training and experience, which shall be accessible to the Secretary of Agriculture in selecting eligibles for special positions.

L. of C.

IV.—Eligible Lists.

A record will be kept for each person on the eligible list of all the subjects in which he has passed.

Eligible registers shall continue two years from the date of examination.

Eligibles shall be drawn from the lists thus established to fill all vacancies in the scientific and technical service of the Department of Agriculture. Inspectors, assistant inspectors, meat inspectors, stock examiners, microscopists, and assistant microscopists in the Bureau of Animal Industry outside of Washington, and river, rainfall, and other special observers in the Weather Bureau, are not considered within this class and these positions are to be filled as hereafter provided, or that failing, as provided under VI.

V.—Appointments and Promotions.

Candidates on the lists thus established shall be eligible to appointment to any position in the Department of Agriculture below the grade of assistant chief, under regulations to be established by the Commission. Vacancies occurring in any grade in the Department shall as far as practicable be filled by promotion from lower grades on such tests of fitness as the head of the Department shall prescribe. When this is not practicable, the Secretary of Agriculture shall call upon the Civil Service Commission to make certification from the aforesaid list of eligibles in accordance with the statement which he shall make regarding the duties of the position to be filled and the relative importance of these duties. It is expected that the positions of assistant chief and chief will ordinarily be filled by promotion, but in case this is not practicable, special examinations shall be held in which the employees of the Department shall be allowed to compete.

VI.—Temporary Service in Minor Positions.

Each candidate shall at the time of examination state whether or not he is willing to accept temporarily a position in the service of the Department outside the class of "assistant" here provided for, and if so, what branch or branches of work he prefers. A record of this shall be kept in connection with the eligible lists of the branches thus selected, and whenever the Department of Agriculture shall ask for a veterinary inspector, microscopist, clerk-copyist, bookkeeper, stenographer, compiler, artist, curator, propagator, skilled laborer, or other class of eligible outside the class of "assistant" here provided for, the Civil Service Commission shall give the person who has passed the assistant's examination (if there be one) preference in the certification. In case of failure to find such scientific eligible, these positions shall be filled as heretofore from the lists of eligibles for the general departmental service.

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